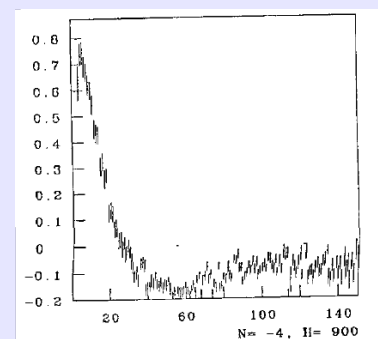


# First TPC: The Agony and the Ecstasy

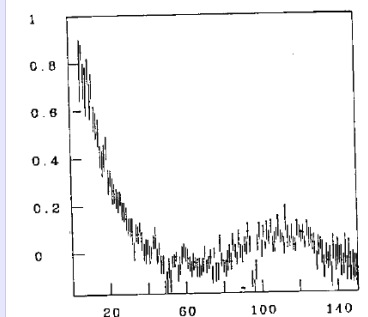
The road to physics results was not that easy!!!

- Aug-1980: Superconducting Magnet failure: replace with conventional coil, reduce Momentum resolution by factor  $15/3.9=3.8$
- Aug-1981 Cosmic ray test: large distortions due to inhomogeneities in the field cages (of order of mm)
- Corrections were evaluated and applied as a function of sector and wire number
- May-1982 First beam running: charge build-up due to positive ions. (of order cm)
- Gated grid was used to avoid this problem
- Momentum resolution further degraded

Distortions (cm)



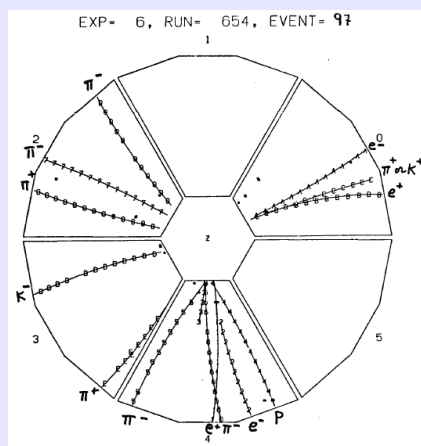
BLO RGX BLO W04 Dz/Tan.d



Wire number

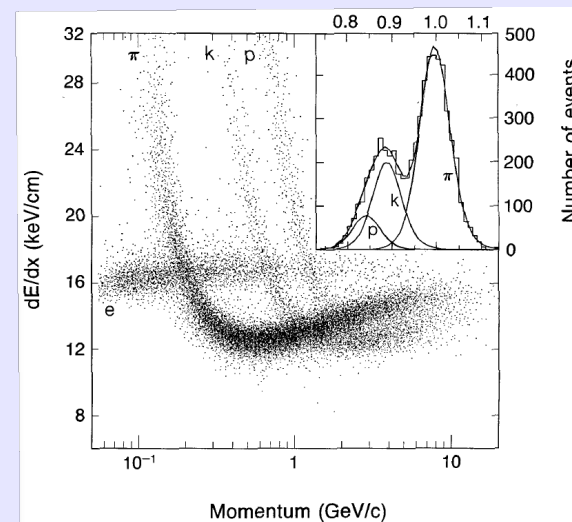
# PEP4-TPC Performance

- 1982-1983 data

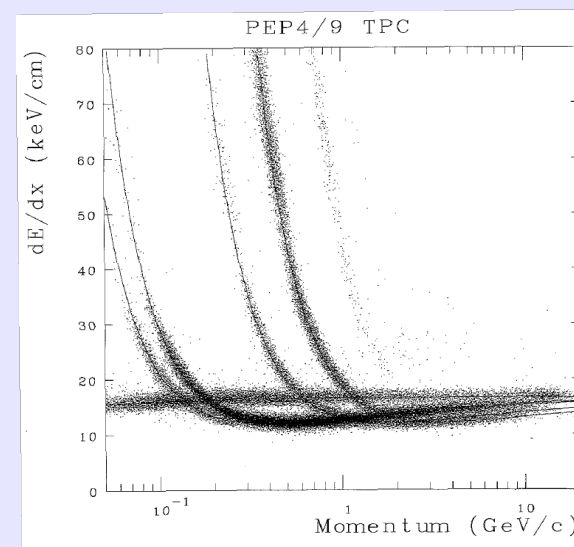


13 tracks  
12 identified,  
1 uncertain

DE/dx resolution 3.7%



- After Fall 1984:
  - Fixed distortions:  
Field cage coating, gated grid
  - SC magnet installed:  
much better momentum resolution  
 $\mu$  and  $\pi$  are separated



# Physics results

1984 First physics papers (20 published papers by Jan 1985)

Search for Charge  $4/3$  particles (John Huth's thesis)

Charge Hadron production (Nick Hadley's thesis)

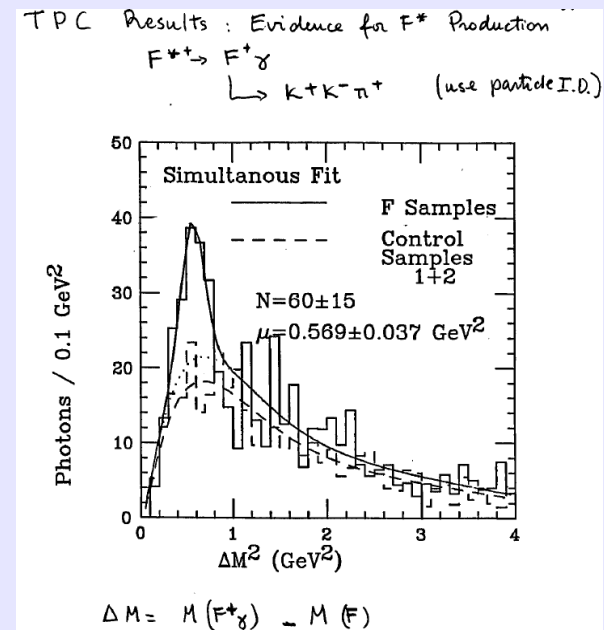
Tau lepton branching ratios (Bill Moses's thesis)

Strangeness Correlation {Marjorie's thesis}

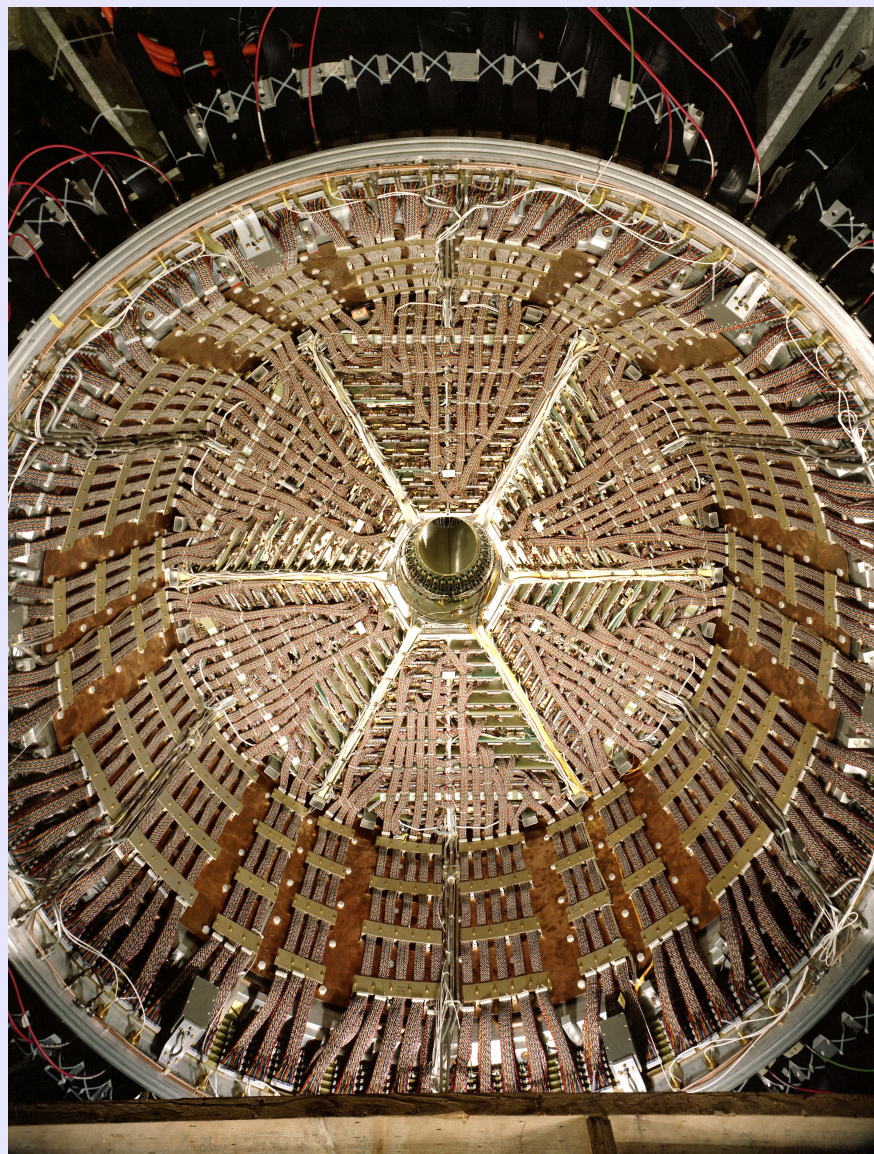
Prompt electrons from b and c quarks (Hiro's thesis)

Parton fragmentation in 3 jet events (Bill Gary's thesis)

Discovery of the  $F^*$  (now  $D_S$ )  
meson (Ryoji Enomoto's thesis)



# PEP4-TPC



End cap of the TPC (1981)